



A.D. 1830 N° 5958.

S P E C I F I C A T I O N

OF

WILLIAM TAYLOR,

FURNACES AND BOILERS OF STEAM
ENGINES.

L O N D O N :

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Furnaces and Boilers of Steam Engines.

TAYLOR'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, WILLIAM TAYLOR, of Wednesbury, in the County of Stafford, Engineer, send greeting.

WHEREAS His present most Excellent Majesty King William the Fourth, by His Letters Patent under the Great Seal of Great Britain, bearing date
5 at Westminster, the Nineteenth day of July, One thousand eight hundred and thirty, in the first year of His reign, did, for Himself, His heirs and successors, give and grant unto me, the said William Taylor, His especial, full power, sole privilege and authority, that I, the said William Taylor, my exors, admors, and assigns, and such others as I, the said William Taylor, my exors,
10 admors, or assigns, should at any time agree with, and no others, from time to time and at all times during the term of years therein expressed, should and lawfully might make, use, exercise, and vend within England, Wales, and the Town of Berwick upon Tweed, my Invention of "**CERTAIN IMPROVEMENTS ON BOILERS AND APPARATUS CONNECTED THEREWITH, APPLICABLE TO STEAM ENGINES AND**
15 **OTHER PURPOSES ;**" in which said Letters Patent is contained a proviso that I, the said William Taylor, shall cause a particular description of the nature of my said Invention, and in what manner the same is to be performed, to be inrolled in His Majesty's High Court of Chancery within six calendar months next and immediately after the date of the said in part recited Letters Patent,
20 as in and by the same, reference being thereunto had, will more fully and at large appear.

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NOW KNOW YE, that in compliance with the said proviso, I, the said William Taylor, do hereby declare that the nature of my said Invention, and the manner in which the same is to be performed, are particularly described and ascertained in and by the following description thereof, reference being had to the Drawing hereunto annexed, and to the figures and letters marked 5 thereon, that is to say :—

My Invention consists, first, in improvements applied to a boiler, for the purpose of applying the water thereto ; secondly, in an improvement whereby the deposition of sediment in boilers may be got rid of whilst the boiler is at work ; and, thirdly, in improvements applied to the furnace and chimney, 10 whereby I am enabled more perfectly to burn the smoke. I will now proceed to describe the Drawing hereunto annexed, in which is represented a means of carrying each of my said improvements into effect.

DESCRIPTION OF THE DRAWING.

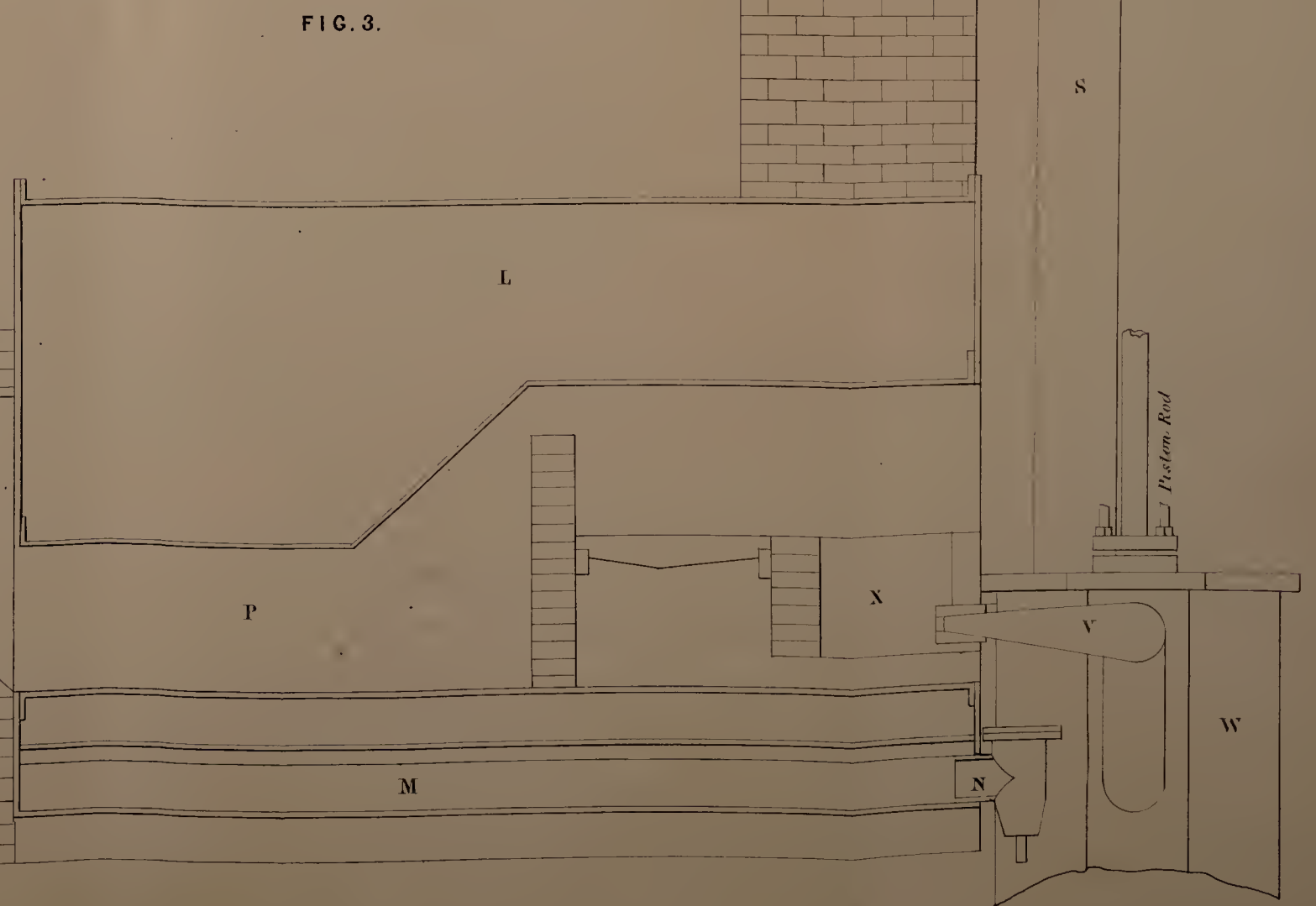
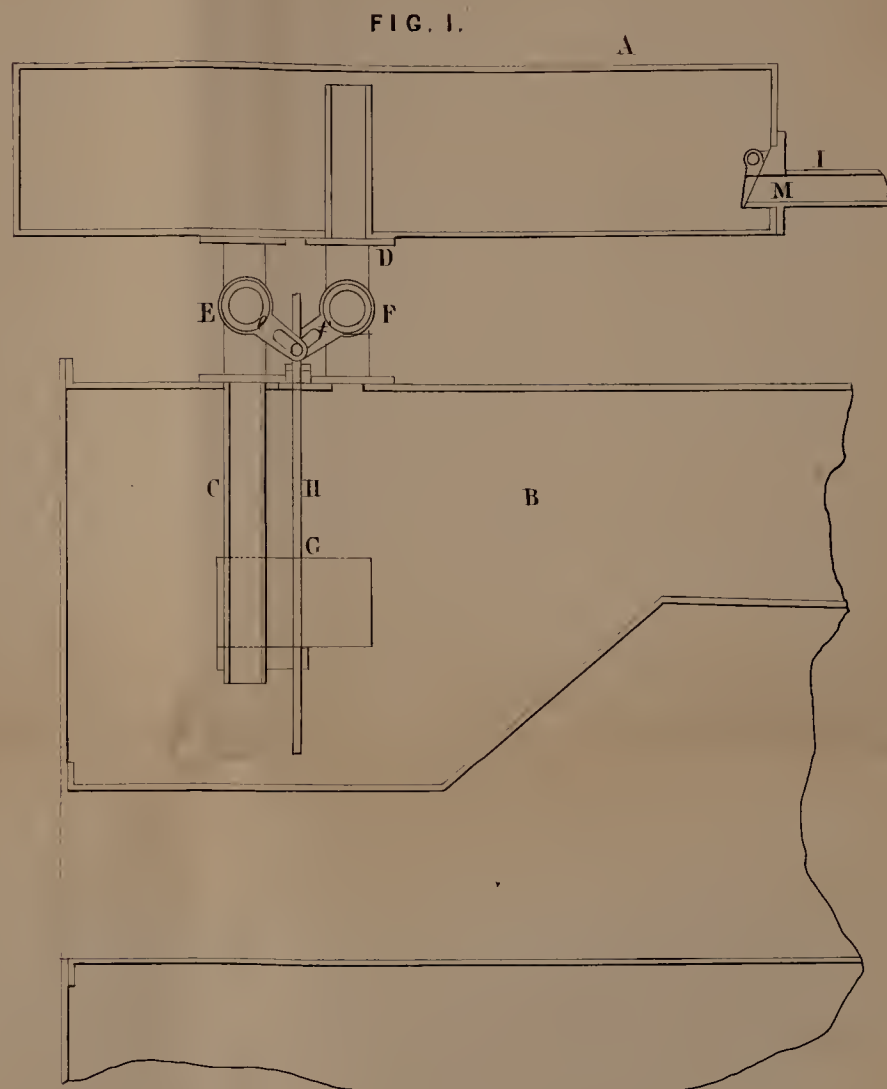
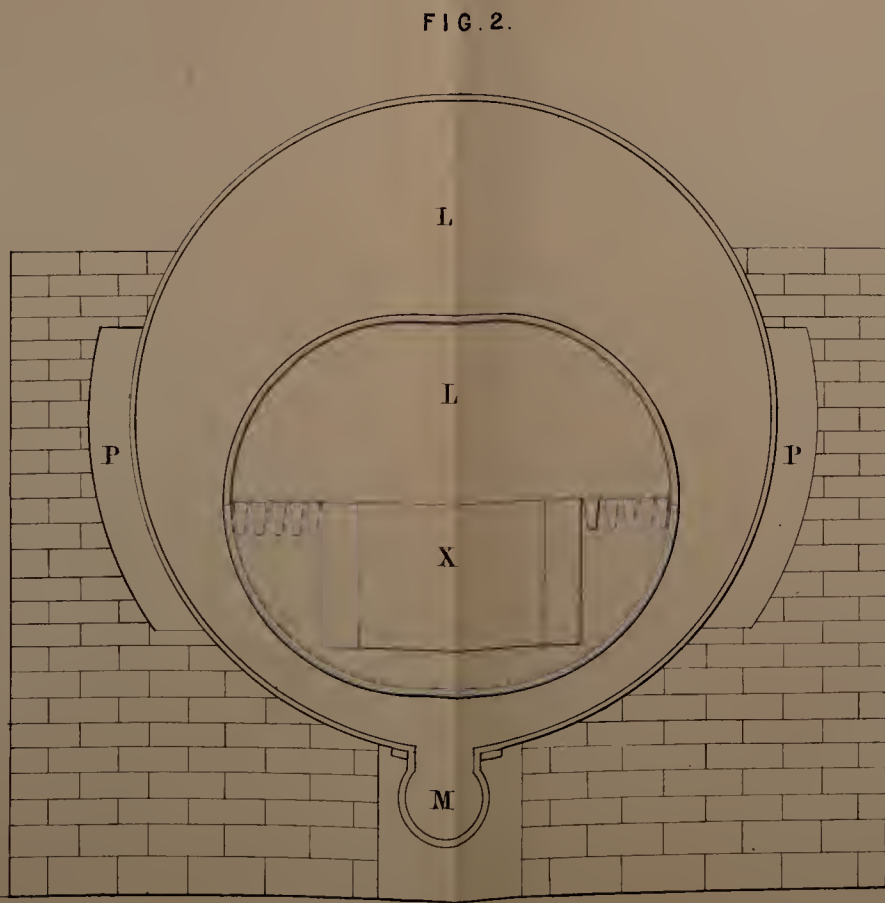
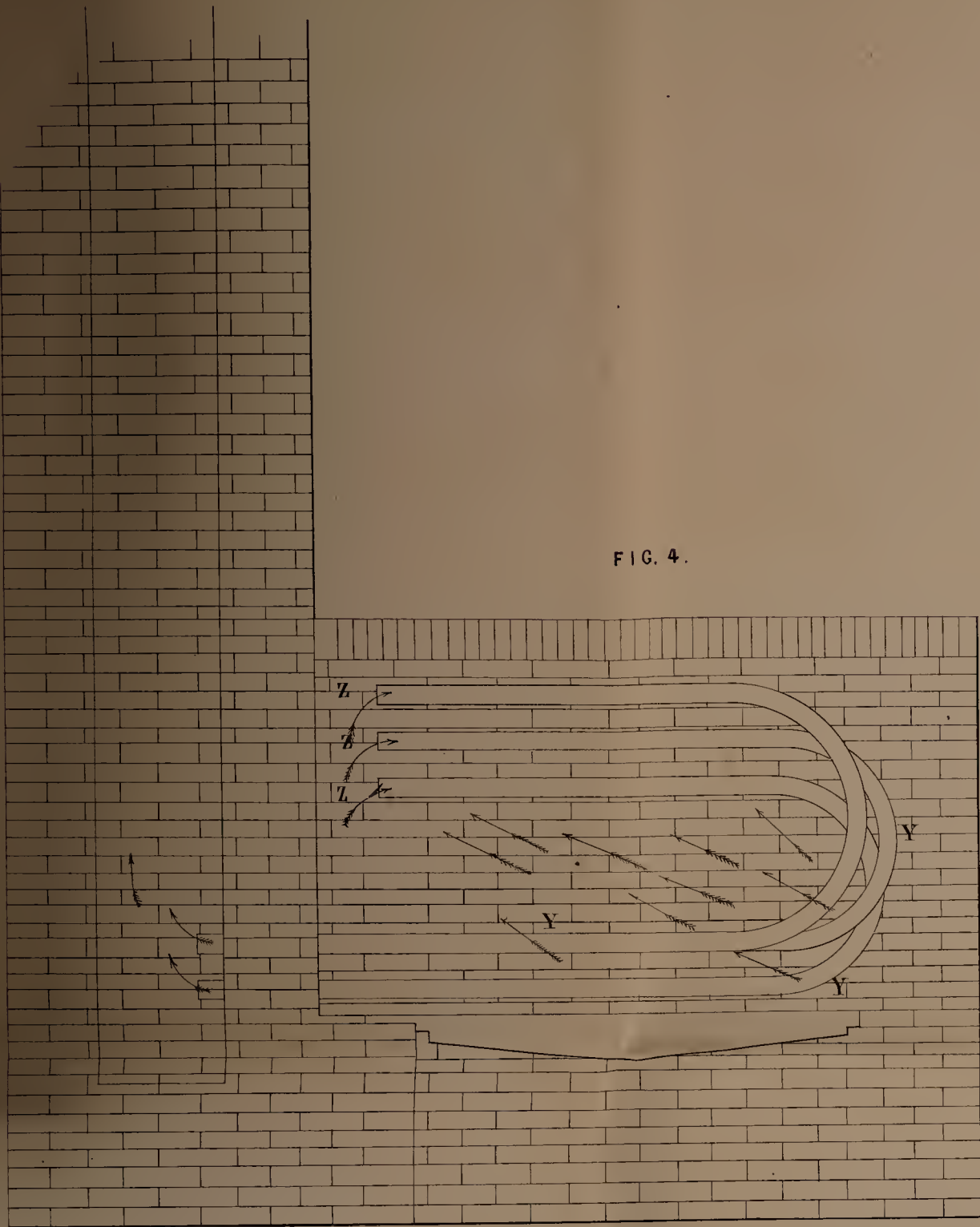
Fig. 1 represents a longitudinal section of what I call the water supply 15 vessel, it being the vessel into which the water first enters prior to its being admitted into the boiler ; this Figure also shews part of the section of a boiler for the purpose of shewing the manner of applying the water supply vessel to a boiler. A is the water supply vessel ; B, the boiler ; C, the water pipe which descends from the vessel A into the boiler ; and it is by this pipe C that the 20 boiler is supplied with water from the vessel A. D is a pipe ascending from the top of the boiler into the vessel A, which pipe is for the purpose of conveying steam from the boiler to the top or above the surface of the water contained in the vessel A, the purpose of which will hereafter be more particularly described. E is a cock on the pipe C, and F is a cock on the pipe D, which 25 cocks are opened and shut by the handles *e* and *f*, in each of which handles there is a slit cut for receiving and permitting to slide a stud fixed on the rod of the float which regulates the quantity of the water supplied to the boiler. G is the float, and H the rod ascending therefrom. I is a pipe by which the water supply vessel is filled, either by means of a pump or from a reservoir, on which 30 pipe I there is a valve M, opening inwards, as shewn in the Drawing. Having now described the various parts represented in this Figure, I will describe the manner of their action ; in doing which I will suppose that the water has been forced or flowed into the vessel A, and that that vessel is full ; such being the case, when the water line in the boiler becomes lowered the float G will follow, 35 and by means of the rod H will draw down the handles *e* and *f* of the cocks E and F placed on the pipes C and D, by which means the steam will be permitted to flow up the pipe D to the top of the vessel A, which will equalize the pressure in the

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vessel A and the boiler B, when the water will descend through the pipe C into the boiler, till the level of the water in the boiler has arrived to the proper height, which will raise the float G, and close the cocks E and F. I would here observe that when the pressure of the steam is acting in the vessel A, the
5 valve M will be closed, and thus prevent the water being driven out at the pipe I; but so soon as the cocks E and F are closed the pressure of the steam will be stopped in the vessel A, and thus permit the water to flow into and again fill this vessel. Having now described the first part of my Invention, I would have it understood that what I claim is the application of a separate vessel,
10 similar to that described as the water supply vessel A, when the water is supplied therefrom by the steam from the boiler being permitted to flow into and equalize the pressure, and thus allow the water to flow into the boiler, as above described. I will now describe Fig. 2 and 3, which represents a means of getting rid of the deposition or sediment whilst the boiler is working. L is
15 the boiler, and M is a recess or smaller vessel connected to the bottom or lower part of a steam boiler in the manner shewn in this Figure. N is a pipe connected to the vessel M, having a stop valve or cock thereon; so it will be evident that as the deposit will be continually taking place in the vessel M, if the cock of the pipe N is opened, the pressure in the boiler will force out such
20 deposit or sediment through the pipe and valve N, and thus may the deposit be got rid of from time to time. I would here observe that the vessel M should always be placed in such a position as at all times to contain the coldest particles of the water, which in boilers having the fire within them will always be at the bottom, as is shown in the Drawing; but in boilers where the fire is
25 made to act on the outer surface of the bottom of the boiler, the vessels M must be placed on each side of the boiler, and protected from the action of fire, as it is necessary that the vessels M should at all times contain the coldest part of the water of the boiler. Now I would have it understood that I am aware that boilers or salt pans have been made with troughs or vessels protected from
30 the action of the fire, and thereby such troughs or vessels contain the coldest part of the matters boiled in such vessels, but I lay no claim to such salt pans or boilers for making salt when so constructed, they being already known. But what I claim is, the application of the vessel M and the valve or cock N to the boilers of steam engines for the purpose of getting rid of the sediment in the
35 manner above described, and which as aforesaid forms the second part of my Invention. Fig^s 2 and 3 also show part of my improvements in the apparatus applied to a furnace of a steam boiler; L being the boiler; P, P, the flues, passing through and around the boiler; Q, the chimney, which is closed at the top. R is an outlet placed at some distance from the top of the chimney. S is a pipe con-

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nected to the top of the chimney, which pipe S descends to an exhausting and blowing apparatus, having a valve placed at the lower end opening into the cylinder of the blowing apparatus. V is a pipe leading from the exhausting and blowing apparatus W through the ash pit and into the recess, or well formed under the bars at the fire-place at X, which recess or well is shown as constructed 5 of fire bricks, and is open at top into the fire-place, whereby it is at all times filled with coals, and at the bottom it is sufficiently open to permit of the ashes being raked out, but which ashes are always to be kept sufficiently above the opening at the bottom of the well X to prevent the smoke which is forced through the pipe V being driven in any other direction than upwards through 10 the burning coal, as will be fully described hereafter. Having now described the parts represented in this Figure, I will proceed to describe the manner of their action. The fire being lighted, the smoke will pass along the flues P, P, and thence into the chimney Q, from whence it would pass out into the atmosphere through the outlet R, but that it is prevented by the working of the 15 exhaustion and blowing apparatus W, which will cause the smoke to pass through the pipe S into the cylinder W, whenever the piston in such cylinder is raised, and the return stroke of the piston will force the smoke so withdrawn from the chimney through the pipe V, into and through the burning coal, and thus will the smoke be continually forced through the fire; but in order to 20 have a continued action of the blowing apparatus in withdrawing and forcing the smoke it will either be necessary to have two cylinders working in succession, or to have a closed cylinder, the pipes S and V being connected with the top and bottom of such cylinder, as is well understood in making exhausting and blowing apparatus. It will be necessary here to observe that as the black and 25 dense smoke is only evolved at and a short time after the putting on of fresh coal, it will only be necessary to work the exhausting and blowing apparatus so long as such dense smoke is evolved; this apparatus must therefore be attached to the engine in such a manner as readily to be put into and out of gear, and when disconnected from the engine sufficient draft will be kept up by the 30 outlet R, but in case there be a feeding apparatus applied to the furnace, whereby a continuous supplying of coals is kept up, then the exhausting and blowing apparatus should be kept in continued action. Fig. 4 shews another plan of consuming the smoke in furnaces, and consists in passing a pipe or pipes through the heated coal in such a manner that the smoke evolved 35 must pass through such heated pipes, and thus will the smoke be consumed. Y, Y, Y, are three pipes open at their ends Z, Z, Z, being opened for the passage of the smoke and heated air, which not being able to find vent at any other part of the furnace are obliged to pass down through the pipes Y, Y, Y,



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which being red hot destroys the smoke, but sufficient draft is kept up for the fire by the other ends of the pipes Y, Y, Y, being open to the chimney, as shewn in the Drawing. Now I would have it understood that what I claim as this third part of my Invention is, the application of an exhausting and
5 blowing apparatus to the chimney (such chimney being open to the atmosphere), for the purpose of withdrawing the smoke therefrom and forcing it again through the fire, as above described; and I also claim the passing of a pipe or pipes, in the manner above described, through the burning coal, whereby the smoke evolved by such coal shall, from having no other vent, be obliged to pass
10 through such heated pipes, and thus destroy or burn the smoke so evolved.

In witness whereof, I, the said William Taylor, have hereunto set my hand and seal, this Seventeenth day of January, in the year of our Lord One thousand eight hundred and thirty-one.

WILLIAM (L.S.) TAYLOR.

15 **AND BE IT REMEMBERED**, that on the Seventeenth day of January, in the year of our Lord 1831, the aforesaid William Taylor came before our said Lord the King in His Chancery, and acknowledged the Specification aforesaid, and all and everything therein contained and specified, in form above written. And also the Specification aforesaid was stamped according to the
20 tenor of the Statute made for that purpose.

Inrolled the Nineteenth day of January, in the year of our Lord One thousand eight hundred and thirty-one.

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